Table 1

	Mean
LEQUESNE basal	13,14
LEQUESNE month1	11,08
LEQUESNE month 2	11,00
WOMAC stiffness basal	125,00
WOMAC stiffness month 1	98,33
WOMAC stiffness month 2	90,83
WOMAC functional ability basal	975,36
WOMAC functional ability month 1	805,17
WOMAC functional ability month 2	841,67

Conclusions: The HJL shows efficacy and safety in patients with symptomatic hip OA. We can consider it as a low cost alternative treatment for OA. It is performed quickly, in 30 minutes, and there are not serious complications.

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HIGH INTENSITY LASER THERAPY IN THE REGENERATION OF HUMAN CARTILAGE CHRONIC LESIONS

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Purpose: It is widely known that joint cartilage lesions have a very poor healing capacity. Many studies have explored cartilage regeneration using various techniques involving abrasion, drilling of sub-chondral bone, mosaic-plastic, periosteal and perichondral transplantation, tissue engineering and cell therapy (Autologous Chondrocyte Implantation (ACI) more recently mesenchimal cell one-step implant). With the aim to find a new approach to treat cartilage lesions, we investigated the effects of a High Intensity Laser Therapy (HILT) as a non-invasive method to stimulate tissue repair *in vivo*.
Methods: Human articular cartilage was obtained from the knees of 9 patients affected by chronic cartilage lesions of the femoral tibiae joint due to repeated sport-traumas. All patients were amateur soccer players referring pain during sport activity. The lesions were investigated by RMI and the patients were scheduled for Autologous Chondrocytes Implantation (ACI). The patients were divided into two groups: the first group (henceforth HILT group) (4 males/1 females, mean age: 32 yrs) was processed with Nd:YAG laser (3,000 Joule) daily, 15 times in the 3 weeks required to perform transplantation. 4 patients (henceforth control group) underwent to ACI protocol (3 males/1 female, mean age:31 yrs). When the healthy cartilage biopsy from unloaded zone was taken for chondrocyte isolation and expansion (T0), a small cartilaginous fragment was harvested from the pathologic area. Another specimen was taken just before cell implantation (T1) to verify the efficacy of the laser treatment in both groups. Histological, immunohistochemical and molecular biology analyses were carried out on cartilage samples. The study has been approved by Ethics and Scientific Committees of Rizzoli Orthopaedic Institute and specimens were taken with patients' written consent.
Results: In the Hilt group at T1, the macroscopic observation of the treated zones showed in general a progressive growth of a new tissue from the edges to the central area of the lesions. In contrast, in the control group the lesions were still evident or in some cases covered by a fibro-cartilaginous layer. Histological appearance of the articular cartilage performed by Safranin-O staining in HILT group at T1 displayed, in some cases, a hyaline-like tissue with a good proteoglycan content in particular near the sub-chondral bone. In contrast, low proteoglycans presence and hypocellularity were observed in the control group. Immunohistochemical analysis showed some clusters of collagen type II positive zones in the HILT group and a down-regulation of a series of inflammatory markers.
Conclusions: These preliminary data indicate that HILT treatment is able to facilitate cartilaginous tissue formation in patients with chronic traumatic lesions. The quality of the regenerated tissue is good as concern the extracellular structure, the expression of typical matrix markers even in presence of some fibrocartilaginous features. A reduction of some degenerative molecules testify the anti-inflammatory action of this therapeutical approach.
Therefore, these results advocate the use of HILT for further in vivo studies and could be in particular suggested for the treatment of early cartilage lesions in osteoarthritic patients.

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THE EFFECT OF NEUROMUSCULAR ELECTRICAL STIMULATION ON MUSCLE FUNCTION & FUNCTIONAL PERFORMANCE IN INDIVIDUALS WITH MODERATE TO SEVERE KNEE OSTEOARTHRITIS

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Purpose: Weakness of the quadriceps femoris muscle (QFM) is associated with many of the disabling symptoms of knee osteoarthritis (OA) including pain and functional impairment. Neuromuscular electrical stimulation (NMES) is a treatment modality that improves the strength of the QF and prevents atrophy in patients with knee OA. The purpose of the study was to evaluate the efficacy of a home-based NMES training programme in restoring QFM strength and knee function in a cohort of adults ($<$ 55 yrs) with moderate to severe knee OA according to the Kellgren-Lawrence grading scale.
Methods: Individuals were randomly assigned to an NMES training (n=11) or control group (n=8). NMES was applied using a portable garment based stimulator (Kneehab II, Bio-Medical Research, Galway, Ireland) for 20 min/day, 5 d/wk at an intensity maximally induced for 6 weeks. Subjects were familiarised with the testing procedures one week prior to baseline assessments. QFM cross-sectional area (MRI) and self report outcomes (Western Ontario & McMaster Universities Osteoarthritis Index and Short Form-36 Quality of Life Questionnaire) were measured at baseline and week 6. Isokinetic strength, isometric strength and functional ability (timed chair rise, stair climb and 25m walk) were assessed at baseline during the intervention at week 3 and at week 6.
Results: Compared to baseline, QFM cross-sectional area increased 6% ($p<0.05$), and isometric strength at 60° knee flexion increased 7% ($p<0.05$) at week 6 in the NMES group. WOMAC score improved ($p<0.05$) in the NMES group. Performance in the chair rise, 25 m walk or stair-climb did not change in either group.
Conclusions: In adults $<$ 55 yrs with moderate to severe knee OA, NMES improves isometric knee extensor strength. Patients also reported a subjective benefit in response to a 6 week NMES program.